

Continuous Monitoring Subcommittee

IEC Shared Waters Workgroup and HEP Water Quality Work Group

March 24, 2020

Location: Remote Meeting

Minutes

Attendees: Beau Ranheim (NYCDEP), Bob Schuster (NJDEP) Carrie Ferraro (Rutgers), Chris Girgenti (RIPA), Chris Schubert (USGS), Clay Hiles (HRF), Esther Nelson (EPA), Evelyn Powers (IEC), Jackie Wu (RIPA), Jason Fagel (NYSDEC), Jessica Bonamusa (IEC), Jim Ammerman (NEIWPCC-LISS), Katie O'Brien-Clayton (CTDEEP), Matt Lyman (CTDEEP), Melissa Sinisgalli (PVSC), Neel Patel (NYCDOHMH), Roop Guha (NJDEP), Rosana Da Silva (HEP), Sara Malone (Rutgers), Sara Powell (UFWP), Siddhartha Hayes (HRPT), and Zach Smith (NYSDEC-HRECOS)

Next Meeting: May 19, 2020 (remote only)

1. Introductions and Agenda Overview

Rosana Da Silva opened the meeting and reviewed the agenda.

2. NJDEP DWM&S Continuous Data Monitoring Program

Bob Schuster provided an overview of NJDEP's monitoring program which consists of both estuary and freshwater monitoring with land based monitors and buoy systems. NJDEP is currently looking to expand their network and testing of new loggers ([see online map](#)). When moved to buoy system, NJDEP acquired a vessel and crane to deploy their system as they are 500 lbs., 4 ft. wide, and 12 ft. in height.

Water quality is monitored every 15 minutes and in freshwater, looking at cyanobacteria as well as Dissolved Oxygen, Specific conductance pH, and temperature in the larger, marine buoys. Biofouling is the greatest issue and requires 2 to 3-week maintenance. Bob emphasized maintenance schedules should be based on data review. In an extreme scenario where high biofouling is excessive, requires a weekly maintenance check. Marine loggers require more maintenance than freshwater. Bob and his team are constantly working on changing and improving maintenance. The agency is not allowed to correct data per their QAPP, therefore Bob is often reviewing data biweekly to address drifts as soon as possible. NJDEP built a software that can help flag thresholds, though review is always necessary as those flags may be valid data upon reviewing precipitation, weather patterns, etc. No software program can replace best professional judgement (BPJ). Data evaluation and QA needs to account for various conditions

(large changes in turbidity, for example, can be due to rain). They also record a calibration log sheet pre and post deployment.

3. NYCDEP Continuous Water Quality Monitoring

Beau Ranheim provided an overview of NYCDEP's program which started up in 1998 in conjunction with their ambient harbor survey. NYCDEP has seasonal loggers that have yet to be deployed for spring due to COVID. The challenges outlined by Bob with the buoy systems are the key reasons NYCDEP moved to using YSI EXOs mounted onto bulkheads with solar powered electrical boxes that include cellular connection for year-round monitoring. Data is pulled every 15 minutes and Beau uploads the data into their server every hour. Beau has 10 systems - 4 deployed, 2 in maintenance, and 4 that are being scoped out for new sites. Sites in NY Harbor include Roberto Clemente Park, Red Hook, Governor's Island (Yankee Pier), Brooklyn Navy Yard, as well as a site in Jamaica Bay. The combination of deep water sites and shallow water sites is advantageous because water quality changes quickly and dramatically with depth. Sighting sites is a challenge, particularly finding areas with low foot and boat traffic. Partnerships with local groups are ideal to help keep an eye on the equipment. As of now, data is not publically accessible, though it is something the department is working towards. Data can be provided to interested parties via a spreadsheet. Data is not QA'd right now, but that may change as considerations are being made to add and perhaps expand the program (up to 20 systems) to calibrate the ambient harbor survey.

4. Overall Programs Discussion

Reviewing of data is a key component to a successful program. Bob Schuster noted that their data checks enabled NJDEP staff to see the spikes of cyanobacteria every time there was a rain event in Lake Hopatcong. Bob also mentioned that NJDEP is working with IEC to look into sites and expand monitoring in the Harbor. NJDEP is currently working on a QAPP and has held internal meetings with BEARs to select 5 or 6 stations to be evaluated for ambient and continuous monitoring. Once COVID-19 has cleared, NJDEP plans to scope locations and access to install buoys.

Evelyn Powers asked whether either program keeps their systems in place year round or seasonally. Due to icing, Bob seeks to pull buoys out for the winter. The systems are typically put into place by April and are likely pulled in October. This allows for maintenance of all sondes and reduces the risk of losing a buoy. If systems were installed on bulkheads, loss of equipment to icing would be less of a concern. Beau Ranheim indicated that his equipment is out year long as the system is installed typically to a bulkhead or pier where the only thing in the water is the PVC pipe with the sensors inside them. The equipment is easily accessible by vehicle to maintain year round and NYCDEP has a contract with YSI to maintain the system. Bob indicated that NJDEP use to have a similar contract, though has a staff member who is familiar with replacing modems, etc. and has helped reduce the cost of the department by 2/3rds.

In terms of deploying into new locations, Bob indicated some interesting dynamics observed in the Barnegat Bay with a docked system near-shore to an open water buoy, even just at ½ mile out. In addition, what NJDEP has learned in the Raritan Bay, precipitation and sunlight have impacts on cyanobacteria activity. There is a unique opportunity to pull hourly precipitation data and NOAA's solar data to link up to a continuous monitoring station to look into the productivity of cyanobacteria and improve our understanding. Katie O'Brien Clayton asked if either NYC or NJ DEP are planning to include nutrients. Bob indicated that PCO₂ is monitored in the Barnegat Bay and did purchase a nutrient sonde that he is hoping to test this summer for nitrate and phosphate. The sonde itself can do more, though testing it in the field will focus just on the two parameters. Beau indicated that nutrient sensors in saltwater are difficult but that there seems to be new sensors appropriate for the marine environment. This would require field testing in the harbor. Jim Ammerman indicated that LIS has a significant buoy system and they are looking at nutrients and also have acidification sensors. Katie O'Brien-Clayton echoed Jim's recommendation of having LIS and Save the Sound present at the next meeting on their programs. Jim indicated that challenges identified by Bob and Beau were also expressed in LIS and there is more to discuss there. Evelyn also indicated the Unified Water Study, coordinated by Save the Sound may be expanding into Flushing Bay and would be great to have them present. In an email exchange after the meeting, both Katie O'Brien Clayton and Jim Ammerman recommended Kay Strobel at the University of Connecticut who works with maintaining the LISICOS buoy system, to consider as a future presenter. Katie forwarded a link to a recent webinar presentation Kay Strobel gave at NECAN on the LISICOS buoy system: <https://youtu.be/UEq0ORAPu0g>.

Roop Guha asked whether NYCDEP is planning to expand into the Kills or Newark Bay. Beau indicated that NYCDEP wouldn't have a problem if there is a site to access easily by car and install the system. In the past, NYCDEP did have a buoy system in the Kills which is no longer active.

Ester Nelson asked the presenters if either would be willing to share their approved QAPPs, both Bob and Beau indicated that they would be happy to. Chris Schubert requested that a future meeting, the group should look at QA/QC procedures and where there are challenges and opportunities to learn from one another on improving QAPPs.

5. **Continuous Monitoring Survey**

Per the recommendation of the committee in November, HEP worked on an initial survey to help identify the key differences and challenges amongst monitoring programs in the shared waters. Rosana Da Silva indicated that only 6 participants completed the survey and 4 of those were connected to either HRECOS or the LIS Unified Water Study. This, therefore, limits the scope of the analysis that we can make from the survey results. All programs are continuously monitoring from May through October and are monitoring for DO, water temperature, and salinity. Other parameters are also included, but are scattered. Calibration of equipment is where we had the most varying answers ranging from 7/10 days, weekly, every 4-6 weeks, 6-8 weeks, and biannually. Biofouling was the biggest challenge identified followed by equipment failure. HRECOS

and Rutgers provide an online visual display of their data. Based on responses to the survey and continuous monitoring station locations through HEP's Environmental Monitoring Plan, Rosana developed a [Google Map](#) that everyone can access and see where sondes are located by program.

Next Steps: Rosana will resend the survey to the group to reassess the survey results to help guide topics for future meetings.

6. Discussion and Next Steps

Evelyn Powers discussed IEC's FY18 Workplan which funds were allocated towards implementing a continuous monitoring station to fill in a gap. Per the GoogleMap, there is a clear gap in monitoring within the Kills and the North Shore as previously discussed. IEC would like to fill in this gap and has been considering where to place the station and what equipment to purchase. IEC scouted sites along the North Shore (Kill van Kull) and Arthur Kill. Of those sites, IEC is considering Port Richmond WPCP and Tottenville Marina. Evelyn opened the discussion to the group for comments/recommendations on proceeding forward. Bob Schuster indicated that the marinas listed were areas that NJDEP was looking at. As NJDEP works through their QAPP, Bob will share that with Evelyn. Chris Schubert indicated that USGS would be happy to assist as long as their efforts can be covered and are already monitoring tides in the Great Kills Harbor (which could be upgraded). Bob and Roop Guha supported the effort to look at the Kills.

Next meeting will be fully remote, likely to be narrowed down to 1.5 hours given the time we spent during today's meeting. Siddhartha Hayes indicated that a focus on maintenance as a topic for the next meeting would be preferred as that is one of the greater challenges. Evelyn will reach out to LIS and the Unified Water Study folks to provide a program overview at the next upcoming meeting.